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(71) Applicant(s)

Eldon Engineering Company Limited

(Incorporated in the United Kingdom)

4 Sylvester Street, SHEFFIELD, Yorks, S1 4RN,
United Kingdom

(72) Inventor(s)

Roy Kitteringham

Harry Philip Muscroft

(74) Agent and/or Address for Service

Brian Richards

69 Carr Hill Road, Upper Cumberworth,
NR HUDDERSFIELD, West Yorkshire, HD8 8XN,
United Kingdom

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(56) Documents Cited

GB 2257381 A

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GB 1521839 A

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US 4968189 A

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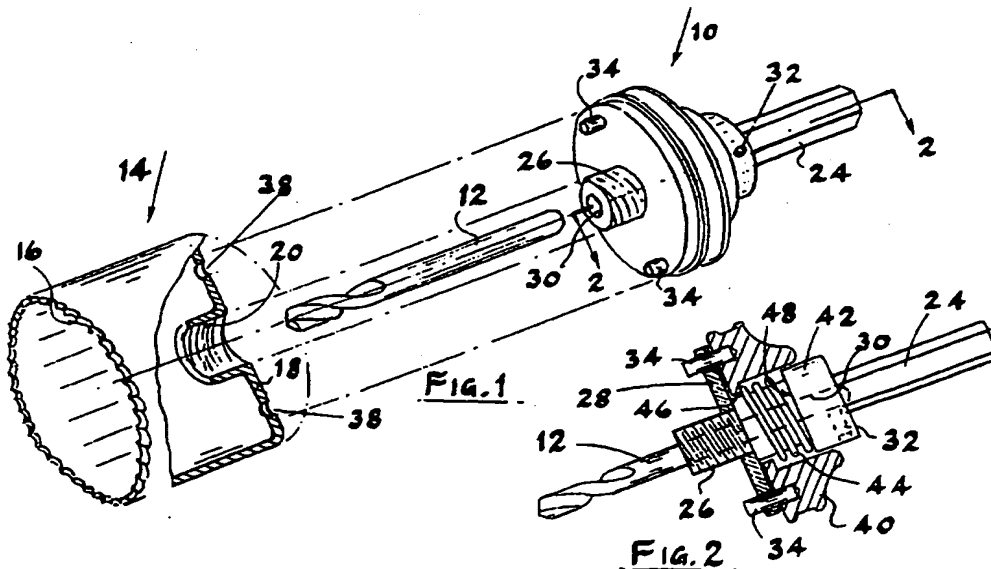
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(54) Holesaw assembly

(57) A holesaw assembly includes an arbor 10 with a screwthreaded end length 26 for engagement in a screwthreaded hole 20 in a carrier plate 18 of a holesaw 14.

So that the holesaw does not become tightly locked in position on the arbor, means are provided for drivably connecting the holesaw to the arbor which include at least one drive pin 34 extending through a clearance hole in a fixed collar 28 and engaging a hole 38 in the carrier plate 18 of the holesaw. So that the assembly is inherently safe to use, resilient means 44 acting against a movable collar 40 which carries the drive pin are located wholly within said collar.



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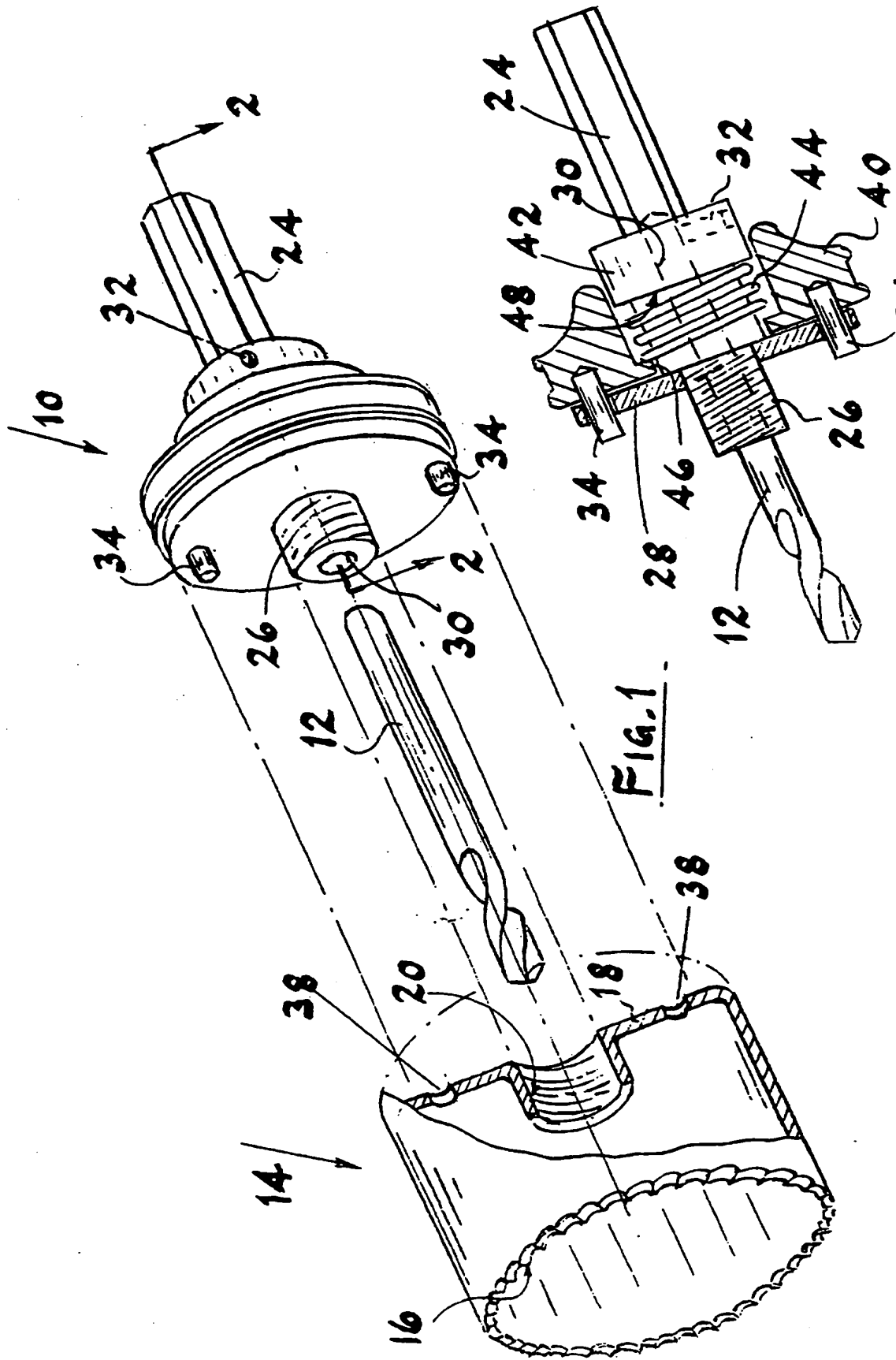


FIG. 1

FIG. 2

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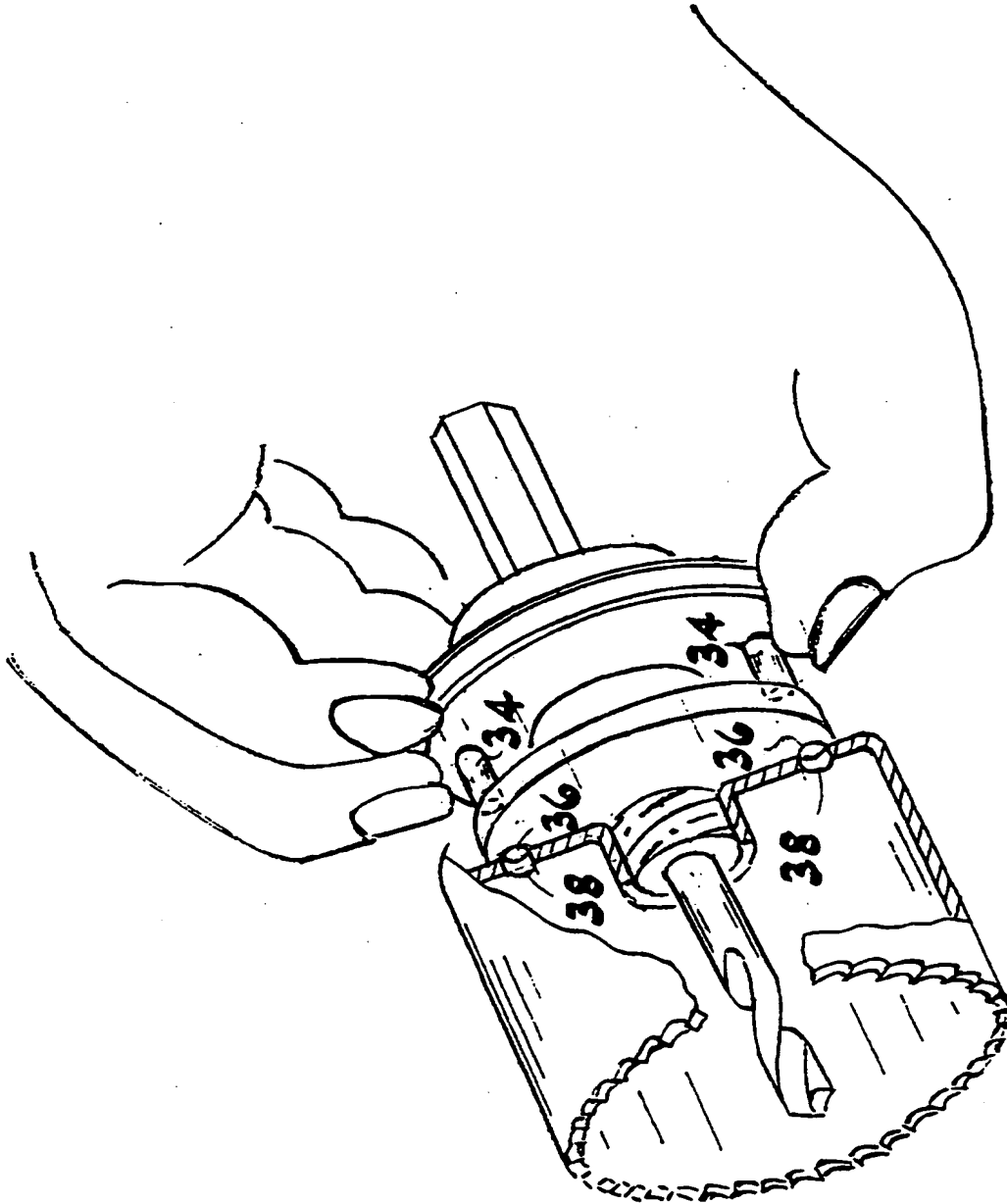


Fig. 3



Fig. 5

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Holesaw assembly

The invention relates to a holesaw assembly.

Holesaws are generally provided in sets for machining relatively large holes, that is to say holes between 32 m.m. and 152 m.m. in diameter. They are of particular use to plumbers and other workmen for machining access holes through, for example, plywood and blockboard panels or through floor boards when installing lengths of pipework. They are generally used in a pistol type electric drill. A holesaw of a selected size is connected to an arbor which can be held in the chuck of the electric drill, the arbor having a conventional twist drill extending therefrom. In use of the device, the twist drill acts as a steady for the hole saw by drilling a pilot hole in advance of said holesaw which is of hollow cylindrical shape with saw teeth at a projecting end thereof.

A conventional arbor for a holesaw has a screwthreaded spindle on which an end plate of the holesaw can be threaded to abut against a fixed shoulder. A particular problem with an arbor of this form is that, during use, the holesaw can become very tightly locked in position on the arbor so that, if the user wishes to change the hole saw for one of a different size, he may waste a considerable amount of time in trying to unscrew it from the arbor.

Various attempts have been made to avoid this problem, for example by the fitment of a locknut which can be released by a spanner, but even this is time consuming and not always a

complete answer to the problem. Other designs have been proposed but a further problem which has been found with these is that they have been prone to clothing and the hair of long haired operatives being entangled in them during use, this being a particular hazard to health and safety at work. The present invention has for its object to provide a holesaw assembly by means of which these problems will be at least alleviated.

According to the invention, there is provided a holesaw assembly including an arbor having an integral radially projecting member to one side of a screwthreaded end length for threaded engagement in a carrier plate part of the holesaw, means forming a driving connection between the arbor and the carrier plate comprising at least one drive pin extending through a clearance hole in the integral radially projecting member for engagement with a hole in said carrier plate part of said holesaw, the at least one drive pin being carried by a movable collar slidably mounted on said spindle and said movable collar being acted upon by resilient means urging it towards a position in which said at least one drive pin engages the hole in the carrier plate part of the holesaw, said resilient means being located wholly within the movable collar.

The means whereby the holesaw can be drivably connected to the arbor will preferably be constituted by a pair of drive pins extending through respective clearance holes in the radially projecting part of the spindle, the carrier plate part of the

holesaw having at least one pair of holes in which said pair of drive pins can be engaged. The radially projecting part of the spindle will preferably be a collar fixedly connected to said spindle, said collar, in use of the assembly, being encircled by a projecting shroud portion of the movable collar.

A resilient washer may be located against the integral radially projecting part of the drive spindle to one side of the screwthreaded end length thereof. The screwthreaded end of the spindle may be provide with a bore for the reception of the shank of a twist drill, clamping screw means being provided for holding said twist drill captive in said bore.

In the accompanying drawings, which illustrate one particular example of the invention :-

Figure 1 is an exploded partly sectioned perspective view of a holesaw assembly embodying the invention,

Figure 2 is an axial section through an arbor forming part of the assembly shown in Figure 1,

Figure 3 is a perspective partly sectioned view showing the holesaw being fitted in position on the arbor,

Figure 4 is a similar view of the completed assembly, and

Figure 5 is a view similar to Figure 2 which illustrates a possible modification which will be referred to.

Referring now to Figures 1 to 4 of the drawings, the holesaw assembly there illustrated includes an arbor, generally indicated 10, a conventional twist drill 12, and one of a selection of holesaws 14 of different sizes which can be

connected selectively to the arbor. The holesaw 14 is of hollow cylindrical shape with teeth 16 at a projecting end thereof and a carrier plate 18 at the other. The carrier plate has a central screwthreaded hole 20 whereby it can be threaded onto a part of the arbor.

The construction of the arbor is best illustrated in Figure 2 and includes a drive spindle 22 having at one end a hexagonal shaft portion 24 which can be fitted in a drill chuck. At its other end the drive spindle is provided with a screwthreaded length 26 terminating in a shoulder formed by an end face of a collar 28 fixedly connected to said spindle (and thus, in effect, being formed integrally with said spindle). The screwthreaded end of the spindle is provided with a blind bore 30 for the reception of the shank portion of the twist drill 12, this being shown to be held captive within the bore 30 by a grub screw 32.

The holesaw is connected to the arbor by being threaded onto the screwthreaded end of the spindle. However, means are provided whereby the holesaw can be drivably connected to the arbor before the carrier plate abuts against the fixed collar 20, these means being constituted by a pair of drive pins 34,34 extending through clearance holes 36,36 in said fixed collar and capable of being engaged with respective holes 38,38 in the carrier plate. The drive pins 34,34 are carried by a movable collar 40 which is slidably mounted on a cylindrical portion 42 of the spindle.

The movable collar 40 is acted on by a coil compression spring

44 which, as shown in Figure 2, is located on the spindle and wholly within the width of the movable collar. Said spring acts at one end against a radially inwardly projecting flange portion 46 of said collar and reacts against a shoulder portion 48 of the spindle.

The arrangement is such that, as the holesaw is being threaded onto the screwthreaded length 26 of the spindle, the drive pins 34,34 can be retracted by sliding the movable collar 40 against the force of the spring 44, as shown in Figure 3. The drive pins can be retracted sufficiently to ensure that their free ends do not protrude from the shoulder provided by the fixed collar 28. Consequently, the holesaw can be threaded fully onto the screwthreaded length 26 of the spindle until it lightly abuts against the fixed collar. From that position the holesaw can be slightly backed off, away from the fixed collar, through a distance of less than half a turn, to enable the drive pins 34,34 to be advanced to engage the holes 38,38 in the carrier plate portion of the holesaw, as shown in Figure 4.

Thus there is provided a holesaw assembly which even after long use will not be difficult to dismantle when it is desired to change the holesaw being used for one of a different size. A different holesaw will always be able to be fitted in a bare minimum of time. It will also be understood that, by virtue of its construction, the assembly is inherently safe; that is to say, resulting largely from the fact that the spring 44 is located wholly within the collar 40, the device is rounded and

smooth so that, in use, it is unlikely to snag the clothing or any strands of long and unruly hair of a user for example.

However, various modifications may be made. For example, in Figure 5 there is illustrated a possible modification in which the form of the movable collar has been modified; the most significant modification is that, in use, a projecting shroud portion 50 of said collar encircles the fixed collar 28. It will be understood that this modified assembly operates and is actuated in exactly the same manner as that first described and illustrated but is even safer because, in use, the narrow gap between the adjacent faces of the fixed and movable collars has been shrouded against the possible entry of any fibres of clothing or strands of hair of the user.

Various other modifications may be made. For example, the movable collar 40 could be provided with any convenient number of drive pins 34. The holesaws may each be provided with a plurality of holes 38 so that, in being connected to the arbor and having been brought lightly into abutment with the shoulder provided by the fixed collar, they do not require backing off very much, if at all, from said shoulder. A resilient washer placed against said fixed collar could provide a very light abutment pressure from which a further very small rotational movement of the holesaw could produce a very slightly increased, but still relatively light, abutment pressure to allow the engagement of the drive pins.

Claims

A holesaw assembly including an arbor having an integral radially projecting member to one side of a screwthreaded end length for threaded engagement in a carrier plate part of the assembly, means forming a driving connection between the arbor and the carrier plate comprising at least one drive pin extending through a clearance hole in the integral radially projecting member for engagement with a hole in said carrier plate part of said holesaw, the at least one drive pin being carried by a movable collar slidably mounted on said spindle and said movable collar being acted upon by resilient means urging it towards a position in which said at least one drive pin engages the hole in the carrier plate part of the assembly, said resilient means being located wholly within the movable collar.

2. A holesaw assembly according to Claim 1, in which the means whereby the holesaw can be drivably connected to the arbor are constituted by a pair of drive pins extending through respective clearance holes in the radially projecting part of the spindle, the carrier plate part of the holesaw having at least one pair of holes in which said pair of drive pins can be engaged.

3. A holesaw assembly according to either one of the preceding claims, in which the radially projecting part of the

spindle is a collar fixedly connected to said spindle, said collar, in use of the assembly, being encircled by a projecting shroud portion of the movable collar.

4. A holesaw assembly according to any one of the preceding claims, in which a resilient washer is located against the integral radially projecting part of the drive spindle to one side of the screwthreaded end length thereof.

5. A holesaw assembly according to any one of the preceding claims, in which the screwthreaded end of the spindle is provided with a bore for the reception of the shank of a twist drill, clamping screw means being provided for holding said twist drill captive in said bore.

6. A holesaw assembly constructed, arranged and adapted to be used substantially as hereinbefore described, with reference to and as illustrated by Figures 1 to 4, or Figure 5, of the accompanying drawings.

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Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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Relevant Technical Fields

- (i) UK Cl (Ed.N) B3C
 (ii) Int Cl (Ed.6) B23B

Search Examiner
 V L C PHILLIPS

Date of completion of Search
 9 FEBRUARY 1996

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

Documents considered relevant following a search in respect of Claims :-
 1-6

Categories of documents

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| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
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Category	Identity of document and relevant passages		Relevant to claim(s)
Y	GB 2257381 A	(ELDON) whole document	1 at least
Y	GB 2013115 A	(STANADYNE) see Figure 2	1 at least
Y	GB 1521839 A	(STANADYNE) see page 2 line 110 + ff	1 at least
Y	GB 1511085 A	(SEGAL) see page 3 lines 15-46	1 at least
Y	US 4968189 A	(PIDGEON) see column 5 lines 9-61	1 at least

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